

Application No.: 09/889,559

Amendment Under 37 C.F.R. §1.111 dated November 12, 2004

Reply to the Office Action dated August 13, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (Currently Amended). A data transmission method between a server incorporating a database therein and a client machine interlinked via a network, data as in a table format retrieved from the database based on a retrieval command from the client machine being transmitted from the database server to the client machine, the method comprising:

 a data table generating step of generating a retrieval data table containing the retrieved data and a data attribute table containing attribute information of the retrieved data, in a memory area on a server side;

 a transmission data generating step of serializing all items contained in the data attribute table and retrieval data table into a single string without adding additional information between the items;

 a control information adding step of adding control information corresponding to the transmission data, to a head of the transmission data;

 a data transmitting step of transmitting the transmission data generated in the transmission data generating step, to the client machine;

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a data table regenerating step of regenerating the data attribute table and the retrieval data table in a memory area on the client side, from the transmission data transmitted; and
a data reading step of reading required data from the regenerated data attribute table and retrieval data table.

Claim 2 (Original): The data transmission method according to claim 1, further comprising: a data compressing step on the server side, of compressing the serialized transmission data and including information on a method of the compression in the control information; and

a data decompressing step on the client side, of decompressing the received data for generation of the transmission data.

Claim 3 (Original): The data transmission method according to claim 1, further comprising: a compression determining step of determining whether or not the transmission data is to be compressed, in accordance with the data characteristic of the transmission data; and

A data compression step of compressing the transmission data and including information on a method of the compression in the control information, if the compression determining step determines for the compression.

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Claim 4 (Original): The data transmission method according to claim 1, wherein all of the items contained in the data table extracted from the database and all of the items contained in the data attribute table are provided by text data.

Claim 5 (Original): The data transmission method according to claim 1, wherein an item in the retrieval data table extracted from the database contains data other than text data.

Claim 6 (Previously Presented): The data transmission method according to Claim 1, further comprising:

a retrieval command generating step performed on the client machine, of generating a serialized retrieval command; and

a retrieval command data transmitting step of transmitting the retrieval command data to the server; and

a retrieval command regenerating step performed on the server side, of converting the retrieval command data into a retrieval command that performs the database retrieval.

Claim 7 (Currently Amended): A database retrieval method, between a micro server and a main server interconnected via a communication link, the micro server receiving a retrieval command from a plurality of client machines, the main server incorporating a database, the retrieval command being forwarded via the micro server, data as in a table format retrieved from the database being forwarded to the client machine via the micro server, the method comprising:

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steps performed on the main server side, of generating and storing in a memory area an extracted retrieval data table and a data attribute table containing description on data attribute of the retrieval data table, of serializing all items in the retrieval data table and data attribute table into a single string of transmission data without adding additional information between the items, of adding control information corresponding to the transmission data, to a head of the transmission data, and forwarding to the micro server; and

steps performed on the client side, of regenerating from the transmission data and storing in a memory area the data attribute table and the retrieval data table, of reading required data from the data attribute table and the retrieval data table, and of forwarding the read data to the client machine that issued the retrieval command.

Claim 8 (Original): The database retrieval method according to Claim 7, wherein the micro server generates and forwards a serialized retrieval command data made from the retrieval command sent by the client machine, and the main server converts the forwarded retrieval command data into a retrieval command thereby executing the database retrieval.

Claim 9 (Currently Amended): A data transmission method in a database system where a plurality of servers each incorporating a database are interconnected via a communication link, data as in a table format being transmitted between the servers, the method comprising:

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steps performed in one of the servers; of generating and storing in a memory area an extracted retrieval data table and a data attribute table containing description on data attribute of the retrieval data table; of serializing the retrieval data table and the data attribute table into a single string of transmission data without adding additional information between the items; of adding control information corresponding to the transmission data, ~~and of to a~~ head of the transmission data; and of forwarding to another of the servers; and

steps performed in said another server: of regenerating from the transmission data and storing in a memory area the data attribute table and the retrieval data table; of reading required data from the data attribute table and the retrieval data table and performing required processing to the read data.

Claim 10 (Currently Amended): A computer-readable recording medium for application to a server incorporating a database therein and a client machine interconnected via a communication link, the medium storing a program for transmitting data as in a table format that is retrieved from the database at a command from the client machine, to the client machine, characterized in that the program includes:

retrieval data table generating means of generating a retrieval data table extracted by the retrieval, in a memory area;

data attribute table generating means of generating a data attribute table containing description on data attribute of the retrieval data table, in a memory area;

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transmission data generating means of serializing items in the data attribute table and retrieval data table into a single string without adding additional information between the items;
data analyzing means of determining application or non-application of a compressing means ~~selected from the above compressing means~~ depending on data attribute of the transmission data.

Claim 11 (Original): The computer-readable recording medium according to Claim 10, characterized in that the medium stores a transmission data processing program including data transmitting means of outputting the transmission data and the control information of the communication link thereby transmitting to the client machine.

Claim 12 (Original): The computer-readable recording medium according to Claim 10, characterized in that the medium stores a transmission data processing program including data compressing means for the serialized transmission data, and decompressing means for the transmission data compressed by the compressing means.

Claim 13 (Original): The computer-readable recording medium according to Claim 10, characterized in that the medium stores one or greater number of data compressing means, and data analyzing means of determining application or non-application of a compressing means selected from the above compressing means depending on data characteristic of the transmission data.

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Claim 14 (Original): The computer-readable recording medium according to Claim 10, characterized in that the medium stores a transmission data processing program including: retrieval command data generating means of generating serializing the retrieval command transmitted from the client machine thereby generating a retrieval command data; and retrieval command regenerating means of converting the retrieval command data into a retrieval command for execution of the database retrieval.

Claim 15 (Currently Amended): A data transmission apparatus comprising a database-side micro server connected with a database server incorporating a database therein and a client-side micro server connected with a client machine, for exchange of data as in a table format, between the database server and the client machine via a network and the micro servers, wherein

database-side micro server includes:

a computing device, a storing device, and a data input-output device capable of inputting and outputting data to and from the database server and the network; a retrieval command generating program of converting a retrieval command data inputted from the client-side micro server into a retrieval command for execution of the database retrieval; a data table generating program of generating a retrieval data table obtained by the database retrieval, in the storing device;

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a data attribute table generating program of generating a data attribute table containing description of data attribute of the retrieval data table, in the storing device;

a transmission data generating program of serializing all items in the retrieval data table and data attribute table into a single string without adding additional information between the items, thereby generating a transmission data;

a control information adding program of adding control information corresponding to the transmission data, to a head of the transmission data;

a data exchange program of exchanging data with the database server; and

a data transmission-reception program for information exchange with the client-side micro server via the network; whereas

the client-side micro server includes:

a computing device, a storing device, and a data input-output device capable of inputting and outputting data to and from the database server and the network;

a retrieval serializing the command data generating retrieval command data program of given by the client machine into the retrieval command data;

a data table regenerating program of regenerating, in the storing device, the retrieval data table and the data attribute table from the transmission data and the control information received ~~from~~ from the server-side micro server; and

a retrieved data reading program of reading the retrieved data from the regenerated retrieval data table and the data attribute table.

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Claim 16 (Currently Amended): The data transmission apparatus according to claim 15, wherein the database-side micro server and the client-side micro server includes a data compression-decompression program including a data compressing program and a decompressing program for the data compressed by the compressing program.

Claim 17 (Original): The data transmission apparatus according to claim 16, wherein the data compression-decompression program includes

one or greater number of data compressing programs, and
data analyzing means of determining application or non-application of a compressing program selected from the above compressing programs depending on data characteristic of the transmission data.